

INSTABILITY OF THE STS SEISMOGRAPH
AT SYOWA STATION, ANTARCTICA
(ABSTRACT)

Masato YAMAMOTO

Faculty of Science, Kobe University, Rokkodai, Kobe 657

Seismic observations by a three-component STS (Streckeisen Seismometer) seismograph were started at Syowa Station (69°S, 39°E) in 1989. The seismographs have been installed in the thermal insulation boxes since 1990. Broad-band (BRB) and long-period (LP) seismic signals were recorded on both cassette magnetic tape and long-term chart recorders for monitoring. The recording has been contaminated by shift-noise and baseline shift. The shift-noise is a kind of pulse-like noise which appears on the monitoring record of the (mostly) vertical component. The baseline-shift is an instrumental drift that causes the recording instrument to deviate from the baseline center on the monitoring seismograms.

In March 1991, a thermometer was installed in the thermal insulation box of the vertical component for making clear the cause of noises. There was a seasonal change in temperature in the box, ranging from 8°C to as low as -7°C.

A total of 591 shift-noises was observed on the seismogram of the vertical component in 1991. During a time when shift-noises occurred more than ten times in a day, the temperature in the thermal insulation box fell suddenly, by 2-3°C, within a few days. At the same time, the daily mean air temperature decreased 10°C in a day. The shift-noise on the seismograms of the horizontal components were recorded only several times during one year.

The occurrence of baseline-shift of the vertical and N-S components were also correlated with temperature change in the thermal insulation box. However, there were no baseline-shifts recorded on the E-W component seismogram through the year.

We concluded from the STS seismic observation in 1991 that noise on the STS seismograms has a significant correlation with the temperature change in the thermal insulation box. We plan to use heaters in the thermal insulation box, to keep the temperature constant.

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